

U.S. Patent Application Serial No. 09/778,562

Applicant: Cohen, et al.

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AMENDMENTS TO THE CLAIMS

This Listing of Claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for modifying the structure of a network accessible web site based on an analysis of activity associated with the web site, the method comprising the
10 steps of:

identifying a plurality of objects of interest associated with a web site;

identifying one or more structural characteristics relating the plurality of objects of interest;

identifying sequential user accesses to the plurality of objects of interest;

15 monitoring activity associated with said web site;

maintaining data representative of said activity objects of interest, structural

characteristics, and user accesses and a present structure of said web site;

applying a set of rules to said data to generate a recommendation; and

modifying said structure of said web site based on said recommendation.

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2. (currently amended) The method of claim 1, wherein the web site comprises a home page, and a plurality of objects of interest, the home page and plurality of objects of interest being accessible by a network address, and further comprising the step of identifying said present structure of said web site.

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3. (currently amended) The method of claim 2, wherein the step of identifying one or more structural characteristics relating the plurality of objects of interest said present structure of said web site further comprises the steps of:

accessing said web site via said network address;

30 parsing the structure data of said web site to identify links between objects of interest
generate said present structure; and

storing data representative of said links as structural characteristic data present structure.

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5 4. (currently amended) A method for modifying the structure of a network accessible web site based on an analysis of activity associated with the web site, the method comprising the steps of:

monitoring activity associated with said web site;
maintaining data representative of said activity and a present structure of said web site;
10 applying a set of rules to said data to generate a recommendation; and
modifying said structure of said web site based on said recommendation.

wherein the step of identifying said present structure of said web site further comprises the steps of:

15 accessing said web site via said network address;
parsing the structure data of said web site to generate said present structure; and
storing data representative of said present structure; and

~~The method of claim 3, wherein the objects of interest of the web site have an inter-connection relationship to each other, numeric identifiers, names, and aliases to the names, and the step of parsing the structure data further comprises at least one of the following steps:~~

- (a) retrieving said names of said objects of interest;
- (b) retrieving said numeric identifiers of said objects of interest;
- (c) retrieving said aliases corresponding to said objects of interest;
- 25 (d) retrieving said inter-connection relationship of said objects of interest;
- (e) retrieving a list of children, wherein said children are the identities of all said objects of interest that may be accessed directly from a particular object of interest;
- (f) retrieving a list of parents, wherein said parents are the identities of all said objects of interest that have direct access to a particular object of interest; and
- 30 (g) retrieving a list of page distances, wherein said page distances are the number of objects of interest that must be accessed to get from one object of interest to a different object of interest.

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5 5. (original) A computer-readable medium having computer executable instructions
for performing the steps recited in claim 1.

6. (original) A computer-readable medium having computer executable instructions
for performing the steps recited in claim 2.

10 7. (original) A computer-readable medium having computer executable instructions
for performing the steps recited in claim 3.

15 8. (currently amended) The method of claim 2, wherein identifying sequential user
accesses to the structure of the web site activity associated with the web site is comprised of user
sessions, the user sessions comprising user accesses, the step of monitoring activity further
comprises the steps of:

20 identifying a user of said user accesses sessions;
assembling the user accesses of a single user into a user session;
mapping data associated with said user session; and
storing said data associated with said user session in a
data storage means.

25 9. (original) The method of claim 8, wherein the step of mapping the data further
comprises the following steps:

retrieving the order of user accesses to said web site's objects of interest; and
retrieving the time of said user accesses to said web site's objects of interest.

30 10. (original) A computer-readable medium having computer executable instructions
for performing the steps recited in claim 8.

11. (original) A computer-readable medium having computer executable instructions
for performing the steps recited in claim 9.

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- 5 12. (currently amended) A method for modifying the structure of a network accessible web site based on an analysis of activity associated with the web site, the method comprising the steps of:
- monitoring activity associated with said web site;
 maintaining data representative of said activity and a present structure of said web site;
10 applying a set of rules to said data to generate a recommendation; and
 modifying said structure of said web site based on said recommendation;
 wherein the web site comprises a home page, and a plurality of objects of interest, the home page and plurality of objects of interest being accessible by a network address, and further comprising the step of identifying said present structure of said web site; and
- 15 The method of claim 2, wherein said maintaining step further comprises at least one of the following steps:
- (a) creating an elements data structure, wherein said elements data structure indicates a total number of objects of interest within said web site;
 (b) creating a session step data structure, wherein said session step data structure indicates the maximum number of steps in any of said user sessions;
20 (c) creating a SPUS structure, wherein said SPUS structure indicates a total number of steps per user session;
 (d) creating a TUS structure, wherein said TUS structure indicates a total number of user sessions;
 (e) creating a CLASS structure, wherein said CLASS structure indicates a class for each object of interest in said web site; and
 (f) creating a TC structure, wherein said TC structure indicates a total number of said classes in said web site.

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- 5 13. (original) The method of claim 12, wherein said maintaining step further
comprises at least one of the following steps:
- (a) creating a distance matrix, said distance matrix having two dimensions, wherein
said distance matrix indicates the shortest object distance;
 - 10 (b) creating a links-to matrix, said links-to matrix having two dimensions in the form
[x][y], wherein said links-to matrix indicates the number of links to a particular
object of interest by a specific Step or less, the number of links is indicated by [y],
the specific Step or less is indicated by [x];
 - 15 (c) creating a links-from matrix, said links-from matrix having two dimensions in the
form [x][y], wherein said links-from matrix indicates the total number of links
from a certain object of interest to other objects of interest by a specific Step or
less, the total number of links to other objects of interest being indicated by [x],
and the specific Step or less being indicated by [y];
 - 20 (d) creating a total accesses-to matrix, wherein said total accesses-to matrix indicates
the total number of accesses to a particular object of interest in a specific Step
within said user session;
 - 25 (e) creating a total access-from matrix, wherein said total access-from matrix
indicates the total number of accesses from a particular object in a specific step
within said user session; and
 - 30 (f) creating an access matrix, said access matrix having three dimensions in the form
[x][y][z], wherein said access matrix indicates the number of times an object of
interest was accessed from one particular object of interest to a different object of
interest at a specific Step, from one particular object of interest being indicated by
(x), to a different object of interest being indicated by [y], and the specific Step
being indicated by [z].
14. (original) A computer-readable medium having computer executable instructions
for performing the steps recited in claim 12.

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5 15. (original) A computer-readable medium having computer executable instructions
for performing the steps recited in claim 13.

10 16. (currently amended) A method for modifying the structure of a network
accessible web site based on an analysis of activity associated with the web site, the method
comprising the steps of:
monitoring activity associated with said web site;
maintaining data representative of said activity and a present structure of said web site;
applying a set of rules to said data to generate a recommendation; and
modifying said structure of said web site based on said recommendation;
15 wherein the web site comprises a home page, and a plurality of objects of interest, the
home page and plurality of objects of interest being accessible by a network address, and further
comprising the step of identifying said present structure of said web site; and

The method of claim 2, wherein the basic rules are applied utilizing a rule engine
algorithm and an anomalies floatation device, the step of applying a set of rules further
comprising the steps of:

- (a) applying a rule of object distance, wherein said object distance is the number of
objects of interest that must be accessed to get from one of said objects of interest
to a different object of interest;
- (b) applying a rule of Step, wherein the Step is the number of objects of interest that
is actually accessed to get from one of said objects of interest to a different said
objects of interest during said user session; and
- (c) applying a rule of Class, wherein said Class is the number of objects of interest
that must be accessed to get from said homepage of said web site to said objects
of interest.

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17. (original) The method of claim 16, wherein said step of applying a set of rules further comprises the steps of:
transferring the maintained data to said anomaly floatation device;
comparing an expected activity data to said data representative of said activity, wherein
10 said anomalies floatation device having an output comprised of anomalies; and
grouping said anomalies according to said activity, wherein said grouping is performed by
said rule engine algorithm to indicate recommendations.

18. (currently amended) The method of claim 17, wherein the step of comparing
15 further comprises at least one of the following steps:

- (a) applying a step-distance anomaly, wherein said step-distance anomaly is based on at least the number of accesses in the particular Step and the distance between two particular objects of interest;
- (b) applying a no-link anomaly, wherein said no-link anomaly is based at least in part on the number of accesses in a particular Step and the distance between the two particular objects of interest, the two particular objects of interest having no direct hyperlink;
- (c) applying a dominant anomaly, wherein said dominant anomaly is based at least in part on a dominant object of interest from which the most accesses are made to a particular object of interest in a particular Step;
- (d) applying a deficiency anomaly, wherein said deficiency anomaly is based at least in part on a deficient object of interest to which a deficient number of accesses are made from a particular object of interest in a particular Step;
- (e) applying a dominant-connect anomaly, wherein said dominant-connect anomaly is based at least in part on a dominant number of accesses being made from said dominant object of interest among a plurality of connected objects of interest to a particular object of interest in a particular Step;
- (f) applying a deficiency-connect anomaly, wherein said deficiency-connect anomaly is based at least in part on a deficient number of accesses being made from a

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5 deficient object of interest among a plurality of connected objects of interest to a particular object of interest in a particular Step; and
(g) applying a high access ratio anomaly, wherein said high access ratio anomaly is based at least in part on the number of accesses in a particular step using only one direction of access and the distance between the two particular objects of interest,
10 the two particular objects of interest having no direct hyperlink. [.]

19. (original) The method of claim 18, wherein if the step of applying a dominant anomaly is applied, the step of comparing further comprises at least one of the following steps:

- 15 (h) applying a threshold-dominant anomaly, wherein said threshold-dominant anomaly is based at least in part on the most accesses to a given object of interest at a plurality of step distances, the accesses to said given object of interest must exceed a pre-set minimum; and
(i) applying a complete-a-link anomaly, wherein said complete-a-link anomaly is based at least in part on the ratio of accesses from a particular objects of interest directly linked to another versus a particular objects of interest linked to others by
20 a greater distance.

20. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 16.

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21. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 17.

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22. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 18.

23. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 19.

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5 24. (original) The method of claim 2, wherein the step of customizing the web site is performed automatically by a computer-readable medium having computer executable instructions for performing the step, based at least in part on said recommendations for customizing said web site.

10 25. (original) The method of claim 2, wherein the step of customizing said web site is performed by interacting with said web site structure through human intervention, based at least on said recommendations for customizing said web site.

15 26. (currently amended) The method of claim 1, wherein sequential user accesses to the structure of the web site activity associated with the web site is comprised of user sessions, the user sessions comprising user accesses, the step of monitoring activity further comprises the steps of:

20 identifying a user of said user accesses sessions;
 assembling the user accesses of a single user into a user session;
 mapping data associated with said user session; and
 storing said data associated with said user session in a data storage means.

25 27. (original) The method of claim 26, wherein the step of mapping the data further comprises the steps of:

 retrieving the order of user accesses to said web site's objects of interest; and
 retrieving the time of said user accesses to said web site's objects of interest.

30 28. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 26.

29. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 27.

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- 5 30. (currently amended) A method for modifying the structure of a network accessible web site based on an analysis of activity associated with the web site, the method comprising the steps of:
- monitoring activity associated with said web site;
- maintaining data representative of said activity and a present structure of said web site;
- 10 applying a set of rules to said data to generate a recommendation; and
- modifying said structure of said web site based on said recommendation;
- The method of claim 1, wherein said maintaining step further comprises at least one of the following steps:
- 15 (a) creating an elements data structure, wherein said elements data structure indicates a total number of objects of interest within the website;
- (b) creating a session step data structure, wherein said session step data structure indicates the maximum number of steps in any of said user sessions;
- (c) creating a SPUS structure, wherein said SPUS structure indicates a total number of steps per user session;
- 20 (d) creating a TUS structure, wherein said TUS structure indicates a total number of user sessions;
- (e) creating a CLASS structure, wherein said CLASS structure indicates a class for each object of interest in said web site; and
- (f) creating a TC structure, wherein said TC structure indicates a total number of said classes in said web site.
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- 5 31. (original) The method of claim 30, wherein said maintaining step further comprises at least one of the following steps:
- (a) creating a distance matrix, said distance matrix having two dimensions, wherein said distance matrix indicates the shortest object distance;
 - (b) creating a links-to matrix, said links-to matrix having two dimensions in the form [x][y], wherein said links-to matrix indicates the number of links to a particular object of interest by a specific Step or less, the number of links is indicated by [y], the specific Step or less is indicated by [x];
 - 10 (c) creating a links-from matrix, said links-from matrix having two dimensions in the form [x][y], wherein said links-from matrix indicates the total number of links from a certain object of interest to other objects of interest by a specific Step or less, the total number of links to other objects of interest being indicated by [x], and the specific Step or less being indicated by [y];
 - 15 (d) creating a total accesses-to matrix, wherein said total accesses-to matrix indicates the total number of accesses to a particular object of interest in a specific Step within said user session;
 - 20 (e) creating a total access-from matrix, wherein said total access-from matrix indicates the total number of accesses from a particular object in a specific step within said user session; and
 - (f) creating an access matrix, said access matrix having three dimensions in the form [x][y][z], wherein said access matrix indicates the number of times an object of interest was accessed from one particular object of interest to a different object of interest at a specific Step, from one particular object of interest being indicated by [x], to a different object of interest being indicated by [y], and the specific Step being indicated by [z].

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- 30 32. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 30.

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5 33. (original) A computer-readable medium having computer executable instructions
for performing the steps recited in claim 31.

10 34. (currently amended) A method for modifying the structure of a network
accessible web site based on an analysis of activity associated with the web site, the method
comprising the steps of:
15 monitoring activity associated with said web site;
maintaining data representative of said activity and a present structure of said web site;
applying a set of rules to said data to generate a recommendation; and
modifying said structure of said web site based on said recommendation;
20 The method of claim 1, wherein the basic rules are applied utilizing a rule engine
algorithm and an anomalies floaration device, the step of applying a set of rules further comprises
the steps of:
25 (a) applying a rule of object distance, wherein said object distance is the number of
objects of interest that must be accessed to get from one of said objects of interest
to a different object of interest;
(b) applying a rule of Step, wherein the Step is the number of objects of interest that
is actually accessed to get from one of said objects of interest to a different said
objects of interest during said user session; and
(c) applying a rule of Class, wherein said Class is the number of objects of interest
that must be accessed to get from said homepage of said web site to said objects
of interest.

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- 5 35. (original) The method of claim 34, wherein said step of applying a set of rules further comprises the steps of:
 transferring the maintained data to said anomaly floatation device;
 comparing an expected activity data to said data representative of said activity, wherein said anomalies floatation device having an output comprised of anomalies; and
10 grouping said anomalies according to said activity, wherein said grouping is performed by said rule engine algorithm to indicate recommendations.

36. (currently amended) The method of claim 35, wherein the step of comparing further comprises at least one of the following steps:
- 15 (a) applying a step-distance anomaly, wherein said step-distance anomaly is based on at least the number of accesses in the particular Step and the distance between two particular objects of interest;
 (b) applying a no-link anomaly, wherein said no-link anomaly is based at least in part on the number of accesses in a particular Step and the distance between the two particular objects of interest, the two particular objects of interest having no direct hyperlink;
20 (c) applying a dominant anomaly, wherein said dominant anomaly is based at least in part on a dominant object of interest from which the most accesses are made to a particular object of interest in a particular Step;
 (d) applying a deficiency anomaly, wherein said deficiency anomaly is based at least in part on a deficient object of interest to which a deficient number of accesses are made from a particular object of interest in a particular Step;
25 (e) applying a dominant-connect anomaly, wherein said dominant-connect anomaly is based at least in part on a dominant number of accesses being made from said dominant object of interest among a plurality of connected objects of interest to a particular object of interest in a particular Step;
 (f) applying a deficiency-connect anomaly, wherein said deficiency-connect anomaly is based at least in part on a deficient number of accesses being made from a deficient object of interest among a plurality of connected objects of interest to a

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- 5 particular object of interest in a particular Step; and
 (g) creating a high access ratio anomaly, wherein said high access ratio anomaly is
 based at least in part on the number of accesses in a particular step using only one
 direction of access and the distance between the two particular objects of interest.
 the two particular objects of interest having no direct hyperlink.();

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37. (original) The method of claim 36, wherein if the step of applying a dominant anomaly is applied, the step of comparing further comprises at least one of the following steps:

- 15 (h) applying a threshold-dominant anomaly, wherein said threshold-dominant anomaly is based at least in part on the most accesses to a given object of interest at a plurality of step distances, the accesses to said given object of interest must exceed a pre-set minimum; and
 (i) applying a complete-a-link anomaly, wherein said complete-a-link anomaly is based at least in part on the ratio of accesses from a particular objects of interest directly linked to another versus a particular objects of interest linked to others by a greater distance.

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38. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 34.

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39. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 35.

40. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 36.

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41. (original) A computer-readable medium having computer executable instructions for performing the steps recited in claim 37.

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5 42. (original) The method of claim 1, wherein the step of customizing the web site is performed automatically by a computer-readable medium having computer executable instructions for performing the step, based at least in part on said recommendations for customizing said web site.

10 43. (original) The method of claim 1, wherein the step of customizing said web site is performed by interacting with said web site structure through human intervention, based at least on said recommendations for customizing said web site.

15 44. (currently amended) An apparatus for modifying the structure of a network accessible web site, the apparatus comprising:
 a communications means for establishing communications with said web site;
 a[n] first input for accepting data representative of structure characteristics of objects of interest activity associated with said web site;
 a second input for accepting data representative of sequential user accesses to the structure of the web site;
 a memory buffer for providing storage for [a] said structure associated with said web site and said activity;
 a processing unit for:
 identifying a plurality of objects of interest associated with a web site;
 identifying one or more structural characteristics relating the plurality of objects of interest;
 identifying sequential user accesses to the plurality of objects of interest;
 maintaining data representative of said objects of interest, structural characteristics, and user accesses;
 applying a set of rules to said data to generate a recommendation; and
 modifying said structure of said web site based on said recommendation; and
 applying a set of rules to said activity and said structure;
 generating a recommendation; and

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5 an output for providing said recommendation.

45. (withdrawn) An apparatus for modifying the structure of a network accessible web site, the apparatus comprising:

a communications means for establishing communications with said web site;

10 an input for accepting data representative of activity associated with said web site and a structure associated with said web site;

a memory buffer for providing storage for said structure and said activity;

a processing unit for

applying a set of rules to said activity and said structure;

15 generating a recommendation; and

an output for providing said recommendation.

46. (new) The method of claim 1, wherein an object of interest comprises a single network accessible document.

20 47. (new) The method of claim 1, wherein an object of interest comprises a plurality of network accessible documents.

48. (new) The method of claim 1, wherein the user accesses are automated.

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5 49. (new) A method for modifying the transitional relationships between states of an interactive system based on an analysis of activity associated with the system, the method comprising the steps of:

identifying a plurality of states of interest associated with an interactive system;

identifying at least one transitional relationship among the plurality of states of interest;

10 identifying at least one sequential occurrence of the plurality of states of interest during system operation;

maintaining data representative of said states, transitional relationships, and occurrences; and

15 applying a set of rules to said data to generate a recommendation for changing the transitional relationships.

50. (new) The method of claim 49, wherein said states of interest are representative of objects in a user interface and the sequential occurrences identify sequential user interaction with the user interface.

20 51. (new) The method of claim 49, wherein the interactive system is a web site, the states of interest are objects on the web site, the transitional relationships are hyperlinks, and the sequential occurrences are user accesses to the web site.

25 52. (new) A system for modifying the structure of a web site comprising:
a processing device adapted to:

identify a plurality of objects of interest;

identify one or more structural characteristics relating the plurality of objects of interest;

30 identify sequential user accesses to the plurality of objects of interest;

maintain data representative of said objects of interest, structural characteristics, and user accesses; and

apply a set of rules to said data to generate a recommendation for modifying the structural characteristics associated with at least one of said plurality of objects of interest.